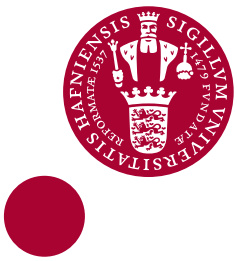

High maximum heart rate in dogs with syncope and heart failure caused by myxomatous mitral valve disease

Rasmussen, Caroline Elisabeth; Falk, Bo Torkel; Domanjko-Petric, A.; Schaldemose, Maja; Häggström, J.; Pedersen, Henrik Duelund; Moesgaard, Sophia Gry; Olsen, Lisbeth Høier

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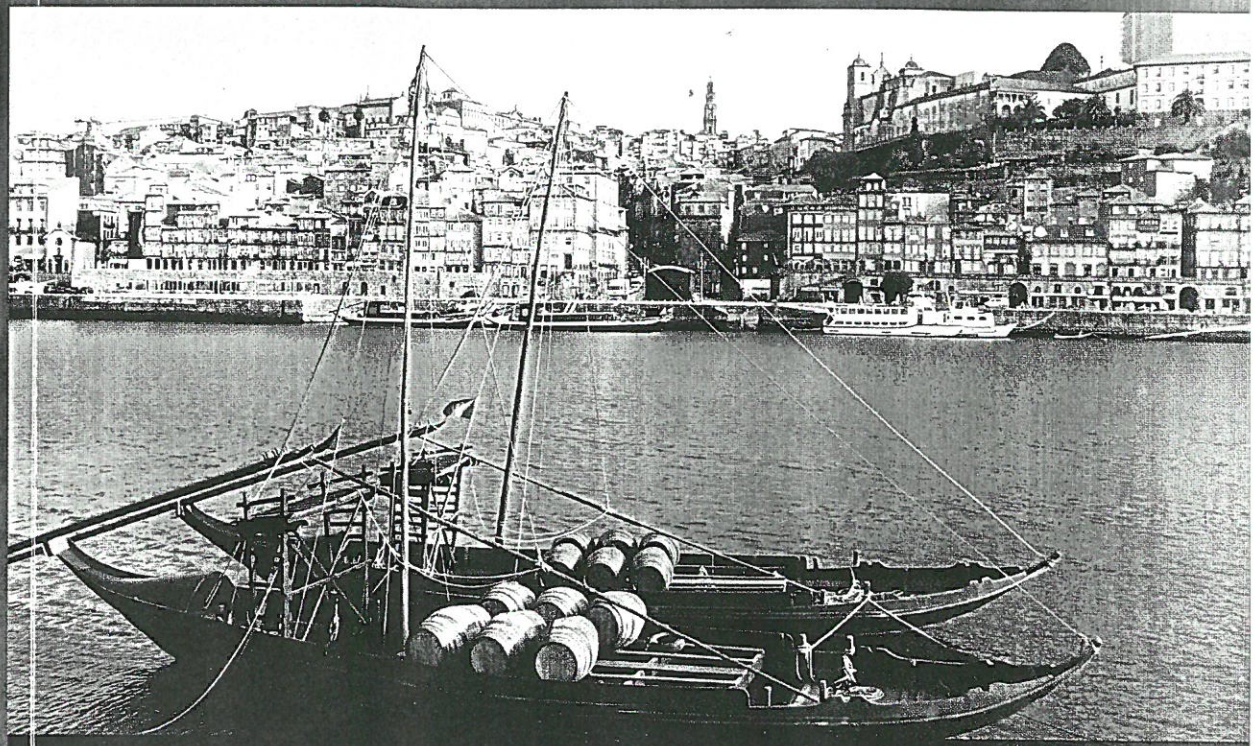

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Pregnancy, a chronic, natural volume-overload state, has important effects on hemodynamic and echocardiographic variables. In the present work we demonstrated an increase of blood pressure, a decrease of LV systolic function during mid-pregnancy, an increase of cardiac output during late-pregnancy, and a decline throughout pregnancy of diastolic function, as demonstrated by TDI A' velocity. This study gives normal ranges for several echocardiographic indices in pregnant Saint Bernard dogs, although it deserves further investigation with a larger and heterogeneous sample.

ABSTRACT NO. 34

HIGH MAXIMUM HEART RATE IN DOGS WITH SYNCOPE AND HEART FAILURE CAUSED BY MYXOMATOUS MITRAL VALVE DISEASE

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Syncope is a cerebral hypoperfusion, which results in temporary collapse or loss of consciousness. Syncope can be seen in both humans and dogs with congestive heart failure (CHF) due to structural heart disease. In these patients, syncope may be a sign of poor prognosis. It is unknown why some dogs in CHF due to myxomatous mitral valve disease (MMVD) develop syncope while others do not. The aim of this study was to examine 24-hour electrocardiographic (ECG) (Holter) characteristics of dogs with and without syncope but with CHF due to MMVD. The study included 31 privately owned dogs of different breeds in CHF caused by MMVD. Owners had noted episodes of syncope in ten dogs. Twenty-five dogs were in CHF therapy. The case history was ascertained and dogs were subjected to clinical examination, Holter monitoring and echocardiography. Arrhythmia analyses were preformed under blinded conditions using Pathfinder digital Holter analysis system with manual review and editing. Three dogs had syncope during the Holter recording. Two dogs had no remarkable ECG changes during the syncopal episode, but the third dog had asystole for 11.3 seconds followed by ventricular escape rhythm. No difference was found between dogs with syncope and dogs without syncope in number of isolated ventricular premature contractions, R on Ts, couplets, triplets, salvos, ventricular tachycardia, atrioventricular blocks, atrial premature complexes, atrial fibrillation, supraventricular tachycardia, bradycardia or sinus pauses. Heart rate (HR) measured at the beginning of the clinical examination was significantly higher in dogs with syncope (172.5±12.5 beats pr. minute (bpm)) compared to dogs without syncope (134.5±3.9 bpm) (P = 0.001). Dogs with syncope also had a significantly higher maximum HR (205.5±4.5 bpm) during the Holter recording compared to dogs without syncope (191.0±3.5 bpm) (P = 0.026). Otherwise, no statistical differences were found between the two groups. In conclusion, it seems unlikely that syncope in dogs with MMVD and CHF is frequently caused by arrhythmias, because this was not a consistent finding and only observed in one of the three dogs with syncope during the Holter recording. The study shows that dogs with syncope have higher maximum HR than dogs without syncope.

ABSTRACT NO. 35

EXTERNAL CARDIAC EVENT RECORDER (R-TEST) – AN USEFULL TOOL IN THE DIAGNOSIS OF NEUROCARDIOGENIC SYNCOPE IN THE DOG

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Vasovagal syncope is the most frequent cause of fainting in human patients. It is self-limiting episode of loss of consciousness characterized by cardio-inhibition and/ or vaso-depression leading to bradycardia and hypotension, respectively. There are only few reports on this condition in dogs and its prevalence in small animals is unknown. Dynamic monitoring of blood pressure and tilt testing are not applicable in dogs, thus long-term cardiac rhythm recording can be the only way of evaluating neurocardiogenic syncope in this species. External cardiac event recording (R-test) is an effective device allowing extended monitoring of cardiac rhythm with usual duration of 7 – 10 days. The aim of this study was to evaluate retrospectively the clinical utility of R-test in the diagnosis of increased vagal tone with cardio-inhibitory component in the dog.
Event recorder was applied in 61 dogs suffering from syncope (n=38), and episodic weakness (n=23). Owners manually activated all recorders when event appeared, or loops were saved automatically when pre-established arrhythmia occurred.
Increased vagal tone was identified in 15 dogs of different breeds. Nine dogs were males, 6 were females. The median age and body weight was 9.0 years and 5.0 kg, respectively. Fainting occurred in 7/15 dogs after coughing episode (n=2), during the physical activity (n=1), and the emotional stress (n=1), after changing of the body position (n=1), and during the unknown condition (n=2). Increased vagal tone caused general weakness without loss of consciousness in 2 dogs (proceded by coughing in 1 case), and was not clinically evident in remaining 6 dogs. Maximum asystolic pause duration with no obvious symptoms was 8.52 sec.
Increased vagal tone was characterized by asystolic pauses with a mean duration of 5.7 ± 2.5 sec (range 3.0 – 10.0 sec) proceeded by sinus tachycardia (n=9), sinus bradycardia (n=3), and atrial fibrillation (n=2). In one case, a paroxysmal atrioventricular block with an atrial rate of 50 bpm was noted during asystole. Asystolic pauses were followed by sinus rhythm (n=5), sinus tachycardia (n=4), ventricular escape beats (n=5), or junctional escape beats (n=1).
Despite the small sample of our study, occurrence of neurocardiogenic episodes during recording was relatively high. Seven out of 10 syncopal episodes experienced during registration were vasovagal and 50% of diagnostic recordings detected a vasovagal response. These events were not addressed in any of previous studies on R-test in the dog.
According to our results external cardiac event recorder can be considered a valid tool in the diagnosis of syncope and episodic weakness of neurocardiogenic origin in the dog.

ABSTRACT NO. 36

THREE-DIMENSIONAL ECHOCARDIOGRAPHY: ASSESSMENT OF LEFT VENTRICULAR VOLUMES AND SYNCHRONY IN DOGS WITH AND WITHOUT HEART DISEASE

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Forty-four dogs of 23 different breeds were examined with 2D and real-time three-dimensional (RT3D) echocardiography. Left ven-